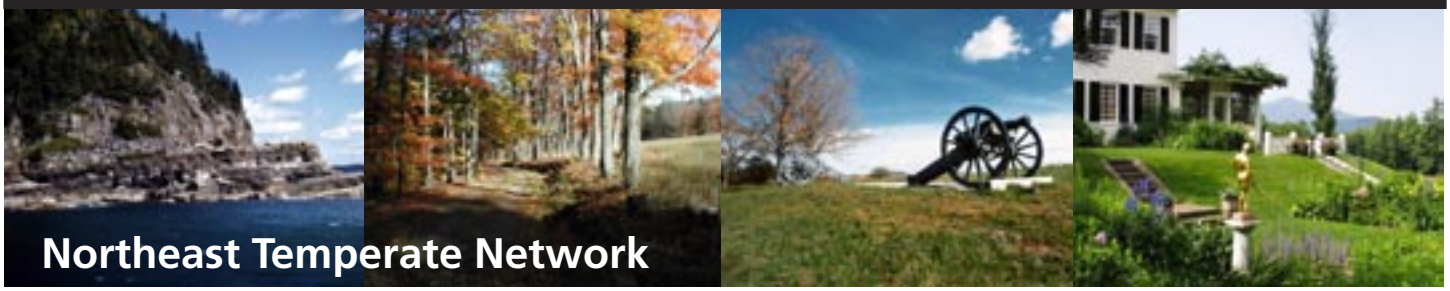
Inventory & Monitoring News

National Park Service
U.S. Department of the Interior

Inventory and Monitoring Program



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From the Sea to the Battlefield: Monitoring Vital Signs in the Northeast

The Northeast Temperate Network (NETN) consists of a diverse group of parks, including Acadia National Park in coastal Maine, Morristown National Historical Park in New Jersey, and the Appalachian Trail, which crosses fourteen states. The majority of NETN parks were established for their cultural resources and are relatively small in size. However, the diversity among them is shown in the over 61 ecological systems that have already been identified within their boundaries.

The intent of park vital signs monitoring is to track a subset of physical, chemical, and biological elements and processes of park ecosystems that are selected to represent the overall health or condition of park resources...

The Network staff and regional scientists are preparing to implement long-term monitoring protocols that are designed to measure vital signs, key indicators of ecological integrity. The vital signs will be used to determine changes that are occurring in key resources, and will provide important data to park managers. The draft of the Northeast Temperate Network Vital Signs Monitoring Plan is now complete, and it is being reviewed in preparation for implementation in 2007. (It can be viewed at http://www1.nature.nps.gov/im/units/netn/reports/reportsθ.cfm.) The first three monitoring protocols to be implemented in 2007 will be: Water Quality, Forest Condition, and Songbirds. These protocols will be evaluated in 2006 and then implemented in the following parks: Acadia NP, Marsh-Billings-Rockefeller NHP, Minute Man NHP, Morristown NHP, Roosevelt-Vanderbilt NHS, Saint-Gaudens NHS, Saratoga NHP, and Weir Farm NHS.

Who's New and News

The Northeast Temperate Network said good-bye to its founding coordinator, Greg Shriver, in 2005. Greg left the National Park Service to accept a position at the University of Delaware as an Assistant Professor of Wildlife Ecology. Before his departure in November, Greg welcomed the Network's new coordinator, Brian Mitchell, and helped to bring him up to speed with the Network's operations.

The Network welcomes Brian. He joined us from the University of Vermont, where he was a Postdoctoral Research Associate studying the effects of landuse change on the distribution of birds, amphibians, and reptiles in the state of Vermont. He earned his BA from Brown University and his PhD from the University of California, Berkeley. Brian's scientific background and seasonal ranger experience make him a valuable addition to the Network's staff.

This year the NETN received a funding increase to accommodate monitoring efforts along the Appalachian Trail. In January the Network's Board of Directors approved three new positions: a monitoring coordinator for the Appalachian Trail, a monitoring coordinator for Acadia NP, and a Science Communication Specialist. The addition of these positions will strengthen the NETN and provide a solid foundation on which our monitoring program will move forward.

For more information contact:

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Putting the Data Puzzle Together

Making data available and presenting it in a form that is both informative and applicable is a substantial challenge confronting an Inventory and Monitoring Network. The NETN hopes that data from the monitoring program will provide park managers with a tangible product to help guide park policy in preserving the natural resources that are an integral part of each park site. It is no longer acceptable to simply distribute data with the hope that the recipient can make sense of all the pieces. To achieve the goal of presenting information in a way that helps the user make well informed decisions, the Northeast Temperate Network is using a "dashboard" application called Crystal Xcelcius to help integrate available data. The term "dashboard" draws upon our familiarity with the modern automobile. Until recently, all cars had dashboards that combined odometers, fuel gauges, speedometers, and other instrumentation, but now manufacturers commonly install systems that combine data obtained from each of these sources to give the driver instant information on fuel economy, distance to empty, and time to destination. The data behind this information has always been there, and an inquisitive driver could manually calculate the values, but modern integration technologies have made the information instantly available and constantly current. Similarly, the Northeast Temperate Network plans to rely on modern data integration strategies to perform a similar function with park-related data originating from different sources and in different formats. This integrated format will allow park managers and the public to understand the information being distributed by the NETN. The Network has also improved its data searching capability. This is an area that we have long thought to be deficient. In the past we had a series of static links on our web site that led to a small collection of documents. This was acceptable at the beginning because we were not making much available, but it clearly was not going to be an efficient way to deliver important information in the future. In recognition of this shortcoming, the Network began working with cooperators at the University of Massachusetts to develop an internet search tool. At about the same time the Network was developing a data delivery plan, the Park Service announced the NRGIS data store. A few weeks previously we were without a solution, and suddenly there were two. We asked our cooperators to develop a direct link to the NRGIS data store instead of having them develop a 'stand-alone' network search solution. The concept was simple, but it took time to work out the details. You can now use the search tools at:
http://www1.nature.nps.gov/im/units/netn/reports/reports.cfm and
http://www1.nature.nps.gov/im/units/netn/data/data.cfm.

Example Dashboard

The Appalachian Trail Vital Signs

View from the AT in Shenandoah NP

The Appalachian Trail (AT) extends along almost the entire Appalachian Mountain range in the eastern United States. It spans 2,175 miles from Mt. Kathadin, Maine to Springer Mountain, Georgia. Appalachian Trail lands include approximately 280,000 acres, making it one of the largest parks in the east. The trail crosses five Inventory & Monitoring networks: Northeast Temperate, Eastern Rivers and Mountains, National Capital, Mid-Atlantic, and Appalachian Highlands. On October 13-14, 2004 the AT Networks convened a meeting where all five I&M Networks, AT staff, Appalachian Trail Conservancy staff, the regional air quality specialist, and the director of the I&M program met to discuss the coordination and direction of the AT Vital Signs program. Prior to the meeting, the Northeast Temperate, National Capital Region, and the Appalachian Highlands Networks had selected vital signs for monitoring. The vital signs from these three networks were compiled and summarized to provide a starting point for selecting AT Vital Signs. Because of the substantial overlap among the three networks that had already prioritized vital signs, the group thought that this list was comprehensive and appropriate for the AT. The group decided to rank the comprehensive list of vital signs and select the highest priority vital signs for the AT. The prioritized list would then provide the foundation to focus the summary of existing information related to each selected vital sign. The *Appalachian Trail Vital Signs* report presents a summary of the existing information from ongoing monitoring programs that cover most of the selected Appalachian Trail Vital Signs. Water quality is an important AT vital sign and summarizing existing water quality information is a necessary step in designing a monitoring program, but this work was beyond the scope of the document. The *Appalachian Trail Vital Signs* can be viewed in its entirety at http://www1.nature.nps.gov/im/units/netn/index.cfm.

The NETN officially oversees the AT now and has consequently received an increase in its base funding. This increase provides the opportunity for the Network to develop and implement monitoring along the Appalachian Trail.

The vital signs that were chosen for the Appalachian Trail are:

- Ozone
- Acid Deposition
- Visibility and Particulate Matter
- Water Chemistry
- Early Detection of Invasive Species
- Forest-Vegetation
- Breeding Birds
- High Elevation-Vegetation
- Priority Rare, Threatened, and Endangered Species
- Visitor Usage and Impacts
- Landscape Dynamics

Gray's Lily

Yellow Warbler

White-throated Sparrow

NETN Bird Monitoring

Beginning in 2006 forest bird monitoring will begin in eight of the Northeast Temperate Network parks: Acadia NP, Marsh-Billings-Rockefeller NHP, Minute Man NHP, Morristown NHP, Roosevelt-Vanderbilt NHS, Saint-Gaudens NHS, Saratoga NHP, and Weir Farm NHS. Birds are an important component of park ecosystems, and their high body temperature, rapid metabolism, and high ecological position in most food webs make them a good indicator of local and regional ecosystem change. In developing comprehensive long-term monitoring plans, landbirds are among the best taxonomic groups to monitor because: 1) they are the most easily and inexpensively detected and identified vertebrate animals, 2) a single survey method is effective for many species, 3) accounting and managing for many species with different ecological requirements promotes conservation strategies at the landscape scale, 4) many reference datasets and standard methods are available, and 5) the response variability is fairly well understood. In addition, birds are a useful biotic indicator of the effects of habitat fragmentation, an ecological stressor that all NETN parks are impacted by. Gaining insights into the long-term trends of avian species composition and relative abundance will provide one measure for assessing the ecological integrity and sustainability of northeastern temperate systems. Additionally, monitoring long-term patterns of bird composition and numbers relative to habitat change due to various stressors, including deer herbivory, invasive species, fragmentation, and silvicultural practices, will improve understanding of the effects on bird populations and help guide management actions within NETN parks.

Steve Faccio of the Vermont Institute of Natural Science (VINS) will be leading the forest bird monitoring program and is looking for volunteers. If you are interested in participating please contact the park or Steve at VINS: sfaccio@vinsweb.org.

NETN Vital Signs Implementation

Vital Sign	*ACAD*	*BOHA*	*MABI*	*MIMA*	*MORR*	*ROVA*	*SAGA*	*SAIR*	*SARA*	*WEFA*
Ozone	●	●	●	●	●	●	●	●	●	●
Atmospheric deposition & stress	●	●	●	●	●	●	●	●	●	●
Contaminants	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧
Climate	●	●	●	●	●	●	●	●	●	●
Phenology	✚		✚		✚				✚	
Shoreline geomorphology	✧	✧								
Water quantity	✚		✚	✚	✚	✚	✚	✚	✚	✚
Water chemistry	✚		✚	✚	✚	✚	✚	✚	✚	✚
Estuarine nutrient enrichment	✧	✧								
Streams - macroinvertebrates	✧			✧	✧		✧		✧	
Invasive/exotic plants-early detection	✚	✚	✚	✚	✚	✚	✚		✚	✚
Invasive/exotic animals-early detection	✚	✚	✚	✚	✚	✚	✚		✚	✚
Salt marsh vegetation	✧	✧								
Rocky intertidal vegetation	✚	✚								
Wetland vegetation	✚		✚	✚	✚	✚	✚		✚	✚
Forest vegetation	✚		✚	✚	✚	✚	✚		✚	✚
White-tailed deer herbivory	✚		✚	✚	✚	✚	✚		✚	✚
Fishes	✧							✧		
Amphibians and reptiles	✚		✚	✚	✚	✚	✚		✚	✚
Breeding birds	✚	✚	✚	✚	✚	✚	✚		✚	✚
Visitor usage	✧	✧	✧	✧	✧	✧	✧	✧	✧	✧
Land cover / ecosystem cover	✚		✚	✚	✚	✚	✚		✚	✚
Land use	✚		✚	✚	✚	✚	✚		✚	✚

Roosevelt-Vanderbilt NHS

The Northeast Temperate Network has finalized its list of high priority Vital Signs for network parks, as seen in the table to the left. Some vital signs are being monitored by existing programs. For example, ozone monitoring is being conducted by other federal programs and we will acquire the data from these agencies and then distribute summaries and analyses to the parks. This year we will be evaluating protocols for the following vital signs: water quantity, water chemistry, early detection of invasive/exotic plants, forest vegetation, white-tailed deer herbivory, and breeding birds. A protocol is a research study design and set of detailed procedures that we will follow to measure status and trends in each vital sign. We will be developing protocols for many of the vital signs in the next two years.

NETN Parks
Acadia NP (ACAD)
Appalachian NST (APPA)
Boston Harbor Islands NPA (BOHA)
Marsh-Billings-Rockefeller NHP (MABI)
Minute Man NHP (MIMA)
Morristown NHP (MORR)
Roosevelt-Vanderbilt NHS (ROVA)
Saint-Gaudens NHS (SAGA)
Saratoga NHP (SARA)
Saugus Iron Works NHS (SAIR)
Weir Farm NHS (WEFA)

✚ = Vital Signs where NETN funds are being used to develop and/or implement monitoring.
● = Vital Signs where other funding is used and the monitoring contributes to an overall assessment of park natural resource condition.
✧ = Vital Signs that need to be monitored in the future but due to funding limitations protocol development or implementation is being deferred.
blank = Vital Sign does not apply to park or there are no plans to conduct monitoring.